

THE
Acclimatisation of Animals:

A PAPER

READ BEFORE THE SOCIETY OF ARTS, LONDON,

BY

DR. F. BUCKLAND, M.A.

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Republished by the Acclimatisation Society of Victoria.  
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WILLIAM GOODHUGH & CO., PRINTERS, FLINDERS LANE EAST,

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INTRODUCTION.

WITH the view of conveying information to the Australian public on the subject of Acclimatisation, which has lately been broached amongst us, the Provisional Committee of the Society have decided upon the publication here of a very interesting paper read in November last, by Dr. F. Buckland, before the Society of Arts in London.

Inheriting a name long famous in the scientific world, Dr. Buckland is lending to it additional lustre, by his devotion to the cause of science. And in the most energetic and zealous spirit he has lately addressed himself to the advocacy in England of the vast and inviting subject of Acclimatisation. Associated with a few gentlemen of kindred tastes, a society has recently been formed in London, under very encouraging auspices; and papers, magazines, &c., now teem with notices upon the subject.

Applying the arguments used by Dr. Buckland in favour of acclimatisation to the circumstances of Australia, it is conceived by the Provisional Committee that everything that can be said in favour of experiments in England, can be urged here with much more force. With an immensely wider area, a finer climate, a more varied range, and unknown resources gradually opening up in every direction, it is impossible to say what a vigorous prosecution of the Acclimatisation project might do for us within even a few years. The six colonies of Victoria, New South Wales, South Australia, Tasmania, Queensland, and New Zealand, contain about 1,010,667 square miles of country, or, 646,826,800 acres, a mere fraction of which is at present converted to any useful purpose.

Meantime, the world abounds with valuable animals, capable of supporting themselves healthily upon that which at present goes to waste, or is for all present purposes absolutely useless. On the immense arid plains of the interior, shut out from

cattle or sheep by absence of grass and insufficiency of water, vast herds of camels might be reared, which would be of great service for the settlers in the hotter and drier portions of the continent.

Mr. Ledger tells us that upon one occasion his herd of Alpacas were without water for a period of twenty-two whole days, and that even then they rather sought to bathe than to drink; and as illustrating the fitness of this country to that animal, he also states that the small flock of cross-bred Llama Alpacas, now in the Zoological Gardens at Melbourne are more healthy, and in better condition than any that he ever saw in their own country.

In respect of game too, nature has not furnished us with any of the Deer or Antelope tribes, or with anything corresponding to the Pheasant, Partridge, Grouse, or Hare of other countries. Yet many of these are already introduced, and doing well; and there is no doubt that we could soon supply the country with everything that could lend a zest to rural recreation, as well as with those things that would add to our commerce, or furnish fresh forms of food to our people.

How encouraging then, the prospects of a vigorous effort here of the nature advocated by Dr. Buckland in England; and with what interest ought we to glance over the list he selects from the very large number of valuable animals in all parts of the world, but little known beyond the immediate localities that they inhabit!

The paper now reprinted is not a mere, dry, scientific discussion; but is invested with so much of a popular character as to be almost as interesting as a novel, while containing many truths calculated to be of the greatest value to mankind. And the Provisional Committee of the newly formed Acclimatisation Society request the kind attention of the public to this paper, and solicit the co-operation of all real well-wishers to the colony towards the object which has been entrusted to their charge.

PAPER

ON THE

ACCLIMATISATION OF ANIMALS.

By F. BUCKLAND, M.A.,

STUDENT OF CHRIST CHURCH, OXFORD, ASSISTANT-SURGEON, SECOND LIFE GUARDS.



IN the present days of progressive movements we find that knowledge of details, and experience of facts, are collected into one focus, and made to bear upon the object aimed at by the means and operations of societies. We have amongst us societies which take cognizance of, survey, and reduce to practice almost every branch of human knowledge, whether in Science or in Art.

There is, however, one subject which until the last few months would seem to have escaped the busy minds of our fellow-countrymen, I mean the art and science of Acclimatisation, a term which may be said to comprehend the art of discovering animals, beasts, birds, fishes, insects, plants, and other natural products, and utilising them in places where they were unknown before.

The importance of this art has not escaped our neighbours the French; and in Paris there has been established, since the year 1854, a society called, "La Société Impériale d'Acclimatation," of which I shall have more to say hereafter in the progress of this paper. But it may be asked, what is the use of acclimatising animals in *this* country? have we not already the best that the world can procure? The answer is, you may think you have the best, but good is the best, till something superior is discovered.

On 22nd January, 1860, I had the good fortune to be invited to a dinner, which will, I trust, hereafter form the date of an epoch in

natural history,—I mean the now celebrated Eland dinner, when for the first time the freshly-killed haunch of an African beast was placed on the table of the Aldersgate Tavern.

The savoury smell of the roasted beast seemed to have pervaded the naturalist world, for a goodly company were assembled, all eager for the experiment. At the head of the table sat Professor Owen himself, his scalpel turned into a carving-knife; and his gustatory “apparatus” in full working order.

It was indeed a Zoological dinner, to which each of the four points of the compass had sent its contribution. We had a large pike from the west, American partridges (shot but a few days ago in the dense woods of the transatlantic east), a wild goose (probably a young bean-goose) from the north, and an Eland from the south. The assembled company—the ardent lovers of Nature in all her works—most of them distinguished in their individual departments.

The gastronomic trial over, we next enjoyed an intellectual feast in hearing from the Professor his satisfaction at having been present at the inauguration festival of a new epoch in natural history. He put forth the benefits which would accrue to us by naturalising animals from foreign parts—animals good for food, as well as ornamental to the park. The glades of South Africa have been described by numerous travellers as reminding them forcibly of the scenery of many of our English parks; and here were the first fruits of the experiment as to whether the indigenous animals of those distant climes would do well in our own latitudes. The experiment was entirely successful, and he hoped would lead to more, and that we might one day see troops of elands gracefully galloping over our green sward, and herds of Koodoos, and other representatives of the antelope family, which are so numerous in Africa, not only enjoying their existence in English parks, but added to the list of food good for the inhabitants of not only England, but Europe in general. The Vice-Chairman, the late Mr. Mitchell, then instanced the case of the Indian pheasants already in course of naturalisation at several points in England, and expressed his conviction that the American partridges we had just partaken of, as well as the European Gelinotte, would thrive well in our woods and copses, particularly in Kent, and that there could not be any great difficulty in getting them over from America for this purpose. Elands, since the present experiment had become public, had been found to answer every expectation; “they had risen in the market;” the demand much exceeded the supply, and there were numerous applicants for them, whose demands, he was sorry to say, the Zoological Society could not now satisfy. There were, however, plenty more elands in South Africa to be had

for the trouble of importing them. A fresh supply was much wanted, and he trusted that this subject might be taken up by those who had convenient pasture ground for them in England, and who would be patriotic enough to further the important cause of the acclimatisation of useful exotic animals in English parks and homesteads.

Professor Owen himself, a few days afterwards, wrote a letter to the *Times*, in which he speaks highly of Eland as a meat, and advocates the cause of acclimatisation. These observations, both verbal and printed, of the learned Professor made a deep impression on all who read or heard, and I may add more especially on my own mind, for they showed us how that science even in her gravest moods, bends to utility, and that there was a grand uncultivated field open to those who would take up the subject in earnest. Shortly afterwards there appeared a remarkable article in the *Edinburgh Review*, No. 224, Jan. 1860, upon the "Acclimatisation of Animals," which we have good reason to believe emanated from the pen of that most accomplished and practical naturalist, Mr. Mitchell, now, alas! no longer among us. This gentleman had evidently been struck with the idea of forming, in England, a society for acclimatisation, similar to that in Paris, which he had just undertaken to manage.

But before going further, I must beg to give an outline of this now justly celebrated society, which has been published, from the pen of an accomplished gentleman, in the columns of the *Field* newspaper. We learn that the Acclimatisation Society was formed at Paris, on the 10th of February, 1854; that, at least, was the date on which it took material form. It was presided over and addressed by M. Isidore Geoffroy Saint Hilaire, who, in a speech full of good sense and sound logic, unfolded the scheme of the society. He told them that the association they were about to form was, up to that day, without an example, that it was to be composed of agriculturists, naturalists, landowners, all the scientific men, not only of France, but of every civilised country, all of whom would aid in a work which required the help of everybody, because it was for the good of everybody. The prospect was, said he, nothing less than to people our fields, our forests, and our rivers with new guests; to increase and vary our alimentary resources, and to create other economical or additional products. In the vegetable kingdom much had already been done; but in the animal almost nothing. We have not one of those Mammifera which are so useful to the inhabitants of Asia and America, and to their indigenous game the French had added three species only—the rabbit, the kid, and the pheasant. M. Saint Hilaire then proceeded to point out that, although their ancestors had

done much for them in adding to the aboriginal stock of animals and fowls, very few additions had been made in modern times. Immediately after the discovery of America, the Spaniards added a few birds to the European stock from the new continent, but no animal of any use to our farms or poultry-yards.

In its first proceedings the society was very modest. At the present time it numbers more than two thousand members, and includes within its roll thirty-five royal names, from the Emperor of the French to the King of Siam, from the Sovereign Pontiff to the Emperor of Brazil. It also possesses a splendid garden, more than 33 acres in extent, in the Bois de Boulogne, and every convenience and appliance for carrying out its principles.

The influence of the Society began to be very speedily felt, and in 1855 a report was presented to the members, from which it appeared that there had arisen in other parts of France a desire to form similar institutions, which were to be affiliated to the parent stem—a movement which was thought well worth the encouragement of the Society—which accordingly affiliated to itself the Zoological Society of Acclimatisation for the Region of the Alps. At the same time it took into correspondence various local and departmental agricultural societies, and determined to enlarge its plans, so as to admit the vegetable as well as the animal kingdom.

In the year 1858, however, it was resolved to take a step in advance, and obtain a garden of an extent sufficient for the purposes of the Society. Thanks to the concurrence of the Imperial Government, and of the Municipality of the City of Paris, this was easily managed, and a space of ground in the Bois de Boulogne, nearly three times as large as the Zoological Gardens in the Regent's-park, was placed at the disposal of the Society.

Perhaps the best exemplification of the manner in which the French Acclimatisation Society set to work, is afforded by the list of prizes which they offered to the competition of the members in the year 1857. It was as follows :—

1. A medal worth £80, for introducing into the mountains of Europe or Algeria a flock of pure Alpaca (*Auchenio paca*.) The flock must consist of three males and nine females at the least.

2. A medal worth £40, for the complete domestication, application to agriculture, or employment in towns of the Kiang (*Equus hemionus*), a valuable beast of burden, of great power and swiftness, which belongs to Thibet, or the peetsi (*Asinus Burchelli*), a South African animal, nearly allied to the zebra, but much resembling the horse. The domestication includes reproduction in captivity.

3. A medal worth £40, for the domestication and multiplication of some large species of kangaroo—*Macropus giganteus*, *M. fuliginosus*

or some other species of a similar size. The winner of this prize must possess, at least, six specimens, and must have bred two generations in domesticity.

4. A medal worth £60, for the introduction and domestication of the Australian emu (*Dromaius Novæ Hollandiæ*), or the American ostrich (*Rhea Americana*). To this are attached the same conditions as the preceding prize.

5. A medal worth £40, for the domestication of the great bustard (*Olistia tarda*). To obtain this prize six adult specimens must be produced which have been reared in domesticity.

6. A medal worth £20, for the domestication and acclimatisation of some new bird of game. Exception taken against all those birds that will injure crops. [Which exception, if severely construed, seems to us as tantamount to a prohibition.]

7. A medal worth £20, for the introduction of an eatable fish into the sweet or brackish water of Algeria.

8. A medal worth £40, for the complete acclimatisation of some new species of silkworm producing silk that may be spun.

9. A medal worth £20 for the acclimatisation in Europe, or in Algeria, of some wax-producing insect, not a bee.

10. A medal worth £20 for new varieties of the Chinese Yam (*Dioscorea batatas*) superior to those which have already been obtained and easier of cultivation.

11. A medal worth £60 for the introduction, cultivation, and acclimatisation of the quinine (*Cinchona*) in Europe, or any of the European colonies.

To this list was added, by the private enterprise of M. Chagot, a member of the society, a prize of £80 for the domestication of the African ostrich (*Struthio camelus*) in France, in Algeria, or in Senegal, it being necessary to produce from two or more ostriches at least two generations, and at least six specimens hatched in a state of domestication, the method of reproduction being as explicable as that of any other bird in the poultry yard.

Thus, we find that in its earliest operations the society paid the greatest attention to increasing the vegetable wealth of the country, not forgetting meanwhile, its principal and even more important duty—that of gaining acquisitions in the animal kingdom.

The proceedings of this valuable Society are now published monthly, and we find in these pages many articles of the most valuable description on the details of acclimatisation; correspondence from all parts of the world, and references to books which bear upon the subjects undertaken. I have not space for analysis of the various and important branches of human knowledge, which, but for the efforts of this society, would most probably be lost to the public welfare.

This, then, is an imperfect outline of the plan of the society which Mr. Mitchell left us to superintend. He has, however, left us a

valuable legacy of the before-named article in the *Edinburgh Review*, in which he seems to have put forth his ideas of acclimatisation, as applied to our own country; and as this paper contains so many valuable hints from long experience, that experience I feel it incumbent upon me to put forth in many of the ideas as to details, that honour should be given where honour is due. He begins with a passage from Lord Bacon, who, among the inventions of the island Atlantes, shadows forth the practice of acclimatisation, in the following words:

"We have also parks and enclosures of all sorts of beasts and birds, which we use not only for view or rareness, but likewise for dissections and trials, that thereby we may take light what may be wrought on the body of man; wherein we find many strange effects; as continuing life in them, though divers parts, which you account vital, be perished and taken forth; resuscitating of some that seemed dead in appearance, and the like. We also try poisons and other medicines upon them, as well of surgery as physic. By art, likewise, we make them greater or taller than their kind is, and contrariwise dwarf them and stay their growth. We make them more fruitful and bearing than their kind is, and contrariwise barren and not generative. Also, we make them differ in colour, shape, activity, many ways. We find means to make commixtures of divers kinds, which has produced many new kinds, and them not barren, as the general opinion is. . . . We have also particular pools, where we make trials upon fishes, as we have said before of beasts and birds. We have also places for breed and generation of those kind of worms and flies which are of special use, such as are with you your silkworms and bees."

Having enumerated the various so-called zoological gardens in Europe, Mr. Mitchell states of them that they have addressed themselves rather to mere exhibition than to reproduction and acclimatisation, and then startles us with the astonishing fact that since the Christian era the only additions to our catalogue of domesticated animals, have been four in number, viz. :—

In 1524 the turkey.

In 1650 the musk duck.

In 1725 the gold pheasant.

In 1740 the silver pheasant.

Here, then, is an answer to the question of the sceptic who believes we have the best of everything; and if he be a gastronome, we appeal to that love of good feeding which we all have more or less, and ask him, if it were not for the acts of acclimatisation which took place in 1524 and 1725, what would he have for dinner on Christmas-day to face the roast beef, and where would his pheasants be which he takes so much pride in preserving in his coverts.

Now if we were to order a taxidermist to set up and prepare a series of all the animals we use in England, whether for food or for orna-

ment, we should, I think, state that they might be all placed in a comparatively small space. But let us walk along those marvellous galleries of the British Museum which are devoted to zoology, and we shall then see how plentifully the world is stocked with life, and how little use we have made of that life; nay, we may go even to the geological gallery and find the bones of creatures which have long been extinct in this country, but whose representatives still enjoy life in distant climates.

In fact, to reduce this matter to figures, the learned President of the Acclimatisation Society in Paris tells us that the world furnishes a list of no less than one hundred and forty thousand animals, and out of this vast catalogue we limit our attention to the small number of forty-three.

I now propose to examine into this catalogue of animal life, and to see which among the numerous individuals composing it we can point out as likely to be of future use to us. I shall not do this at random, but taking as my guides the observations of Mr. Mitchell, in the Edinburgh article, and also the guide of the gardens of the Zoological Society of London, I shall endeavour to point out those animals and birds which from actual experience have been proved to live in this country, and also to multiply their species. There being no reason why, having once bred, they shall not breed and multiply again.

THE ELAND.

To begin with what may well be called the most noble, the largest, the heaviest, and the most useful of the deer tribe, we may well instance the eland, of which I have the opportunity of showing you a magnificent head, through the kindness of Mr. Roberts, furrier, of Regent-street. As Mr. Mitchell justly observes:—"The eland is the *gibier par excellence* of the South African wilderness; his brisket is "the dainty bit they set before the king." Every travelling sportsman in Caffraria agrees upon the fine quality of this meat, and a trial made in England in the beginning of last year, under very unfavourable circumstances, fully confirms all that they have said, for the eland is no longer exclusively African."

In the catalogue of the animals living at Knowsley when the late Earl of Derby died, in 1851, figured five elands, two males and three females, one of which had been born there. The Zoological Society succeeded to this little herd by bequest. The noble collector had been their President for more than twenty years. He had witnessed the decline of the establishment in the Regent's-park to all but

in 1847 with regret, and had rejoiced in the subsequent resuscitation which the Council, in their last report, have candidly and handsomely acknowledged to be due to the exertions and ability of their former secretary, Mr. Mitchell. Desirous of marking his sympathy with this management, Lord Derby directed that whatever group of animals should be considered most eligible for the purpose of acclimatisation, at the time of his death, should be transferred from the Knowsley collection in its entirety to the Society's possession. By the advice of Mr. Mitchell, the elands were most judiciously chosen, and the result has justified all the expectations which he formed of them. The progress of this acclimatisation, which is now perfected, is related in a short paper published in the "*Bulletin de la Société Impériale d'Acclimatation*," and subsequently noticed in the report of the Society, read at their last anniversary. It appears, from the table given in this document, that up to the 29th of April last twenty eland calves had been produced in England from the Knowsley stock, independently of any which may have been obtained from three of the earliest born females, which were exported to the Continent. If the whole number had been kept together up to this time, as was, we believe, the intention of Mr. Mitchell, the united herd would not count less than thirty head. With such a commencement, it is clear that the progress of this interesting labour would have gone on much more rapidly; and that the next five years, instead of ten, would have made the eland not uncommon in our parks.

The merit of the first step towards the acclimatisation of the eland in England is incontestably due to the late Lord Derby. More than twelve years ago his first importation arrived. They bred; but he unfortunately parted with a male. Accident reduced his stock to a single female, who remained barren. Nothing discouraged, he recommenced, and in 1851 the animals, so soon transferred to the Zoological Society, arrived—the female in February, the male in July. They were young, and their first calf was not born until 1853—since then the work has proceeded with great success.

Herd of this noble antelope have been found at Hawkstone, by Viscount Hill; at Taymouth, by the Marquis of Breadalbane; and at Tatton, by Lord Egerton. The stock of the society is still very strong and vigorous, and will, if well managed, continue to supply the nucleus of future home-bred herds—for which applications are constantly made—for years to come.

Lord Hill was the first to profit by the opportunity offered by the society, and he has no less than eight of these animals roaming in his deer park, after having slaughtered a six-year old male for the table

in January last. Though anything but fat, this first essay of the quality of English eland venison satisfactorily corroborated the character unanimously given to it by African sportsmen, travellers, and colonists; the verdicts were taken in not a few gastronomic laboratories—royal, noble, and scientific.*

Nothing can be more stately than the eland, leading out his family along the lovely slopes of Hawkstone, where “a great rocky ridge rises in the midst of the park, and stretches nearly through it, affording every variety of shelter. There the pale tawny flanks of the antelope glisten in the morning light; infinitely surpassing the dun deer in colour, while they rival them in grace, and their great size makes them immediate objects of attention. Their clean small legs, full of power, push them over hill and dale at a tremendous pace; and if an obstacle opposes, their faculty of leaping is almost incredible compared with their weight.”

In order to bring the information relative to the breeding of the eland up to the last moment, I took the liberty of writing to Lord Hill, who most kindly sent me, a day or two ago, the following particulars:—“The elands are going on very satisfactorily, notwithstanding the wet and cold they have been exposed to during the last summer, having no shed or indulgence of any kind since they were turned out in the park in May; they are, however now in a large paddock with a shed in it. I have been most successful in breeding and rearing them, not having lost one. I have now six females and three males, and I hope four of them are in fawn, which will make a good herd next season.” By the kindness of Mr. Bartlett, I am enabled to give the present stock of elands in the Zoological Society’s Garden, viz.:—five females and one male, all doing well, and in good health.

* The following is a note on eland and eland venison, by the Hon. J. Berkeley:—The elands are at present in a paddock at Taymouth Castle, in the park of the black deer. They do very well; and there are at this moment two young ones bred there, who seem to be perfectly acclimatised. There is no sort of reason why they should not do well in all our parks, chases, and forests, as, when at large, there would be no more danger in them to man than in the red deer. As to the editorial remark appended to the question asked by A. B. in the last *Field*, the trial, at the dinner alluded to, of the flesh of the eland was not a fair one; the eland then dressed was not in season, and therefore no decisive opinion could have been formed as to fat flesh, or flavour. In passing, I would observe that it is confinement or being in a half-tame state, that makes animals dangerous to man. The common fallow deer is so when reared by hand. The bison, the eland, the wapiti, the elk, the American antelope, if acclimatised and permitted to run wild in large parks or forests, would fly the presence of man; and my opinion is that the elk, from his knowledge of and ability to clear away the snow, would thrive in the Highland deer forests. These, and thousands of other animals and birds, domestic and wild, might be made available to the United Kingdom by the labours of the Acclimatisation Society.

Here, then, we have good evidence that elands will do well in this country. Let us hope that some day they may become so common as to be used for ordinary butcher's meat.

After the elands, I must not omit to mention the smaller of the antelopes. I may mention the Lencoryx, the Gnu, the various kinds of gazelles, and several others, many kinds of which I am enabled to show this evening through the kindness of Mr. Bartlett and Mr. Leadbeater. Those who wish to see admirable and spirited pictures of the heads and horns of these can do so by referring to Routledge's Natural History, by the Rev. J. Wood, parts xiv., xv., xvi., Vol. I.

Antelopes are delicate things to rear, but yet we find recorded that the harnessed antelope "breeds freely in confinement," as will most probably the Boshbok. The springbok will also live in our parks, and we find a history of them recorded as living in Lord Hill's park, by Mr. Mitchell.

Among the antelope family, as an ornamental animal nothing can excel the eland, except perhaps the Koodoo, which under similar treatment might be acclimatised with equal certainty. As an addition to our economical resources it appears to be in no way inferior. It combines extraordinary quality of flesh with rapid growth, fecundity, and hardiness, in which it is not exceeded by our best short horns, which on the other hand very often fail to reproduce, through excess of fattening property, or from too closely related blood. The great difficulty in these antelopes is their liability to cold, but there is no reason why with shelter and care an attempt should not be made to keep them.

I now pass on to the deer tribe. We know how many thousands of pounds are annually expended in preserving the deer forests of Scotland, and with what result. Compare the comparatively pigmy heads which are brought home by our sportsmen with the heads of deer that do not live, in these days of steam, an immeasurable distance from the deer forests, and are by no means difficult to procure through the proper channels.

If we examine an Ordinance map, how many green spots shall we observe indicating the parks of nobleman and rich proprietors, many admirably suited for deer. Now, out of the deer family, how many are there now in England? but three, viz., the red deer, the fallow deer, and the roebuck. It may well be asked how many of the deer tribe are there on the face of the earth, and why have we so few in England?

The answer is given by Mr. Mitchell, who writes:—"Out of *forty-two* species of deer, exclusive of the little moose deer of Tropical India, there is hardly one which would not adapt itself to our seasons."

First, as regards stags, there is no reason why the red deer of Scotland should not be crossed with the stag of the Odenwald, and those that, as Mr. Mitchell says, are at home in the Woodlands of Central Europe, and thence eastward to the Carpathians.

Then, we have the wapiti, a magnificent deer, a native of the northern parts of America, of which I have the opportunity of showing a fine head, brought by the Hon. G. Berkeley from America. This animal, be it remarked, "breeds every year in the Society's Menageries," and there is no reason why it should not be added, as an ornament, in many of our English parks, where there is room and proper food for it.

Then we have, in the catalogue, the Barbary deer (*Cervus-Barbarus*.) This is the representative of our red deer on the southern shores of the Mediterranean. "The stag and hind, now in the gardens, were presented from the fine herd of this deer which adorn Lord Hill's park, at Hawkstone."

After the Barbary deer, we find the *Barasinghai Cervus Duwancellii*, first imported by the Earl of Derby, a native of Nepaul and Assam. Its winter coat is of a dullish grey, but in summer it changes to a brilliant golden hue, which would make the barasingha the most interesting addition which could possibly be introduced into a heavily-wooded park. Lord Hill, in a letter to myself a few days ago, writes,—“I have also a number of Barbary deer, about 16, and Sambar (another kind of deer), in the park, and these are doing very well.” And then, what is most important, his lordship says none of them appear to interfere with the fallow deer, or the other stock.

There is, besides these, a very hardy deer, which breeds well in confinement, and whose home is in North America, I mean the Virginian deer. This animal would do exceedingly well in Scotland, is not difficult to procure, and is cheap in price; in fact, there is a pair of them in London for sale at this moment. There are other deer whose name must be mentioned, viz.:—a deer, nearly as large as the Bavasongha, which is found in Yucatan; a deer from South America (the *Blastocerus Paludosus*), a hardy little species, which is marked with a white circle round the eye. A roe, as large as a fallow deer, the *Gemul* of Moteria Molina, as well as the Tartarian roe.

Next to the wapiti, in size and beauty of antler, comes the Persian deer—*Cervus Wallachii*. I have also, through the kindness of Mr. Leadbeater, a fine head of this animal to show to the Society. This animal also will breed in England, for we read “The animals were ultimately sent to the Earl of Ducie, who, after keeping them three seasons, most liberally presented them (October, 1860) to the Society.” The two females now in the society's possession are both accompanied

by their fawns, and there seems every probability of this fine species being permanently established. A few weeks ago (October 8, 1860) Viscount Powerscourt was kind enough to send me a catalogue of the deer, &c., in his park at Powerscourt, near Dublin. This nobleman is a most active promoter of the society, and his great success shows how much individual exertion may do. He has now in his park one bull nylgau, one cow ditto; two stag wapiti, three hind ditto; one Barbary stag, one hind ditto; one Sambur deer, six hinds ditto; one axis stag, two hinds ditto; one male llama, one female ditto; one white hind; and about thirty-five red deer; all these are in good health, and the nyлгаus and deer breeding well.

Not many hundred miles from England lives the reindeer; from our earliest infancy we have heard of the great benefit the poor Laplanders derive from it—in a domesticated state they drink its milk; they cloth themselves with the skins; they eat its flesh, and use its sinews and horns; and all the time they use it as a beast of burthen, and drive about in sledges drawn by it. The English sportsman derives excellent sport in pursuing the reindeer in its wild state.

Here then is a beast which recommends itself to the owners of parks and deer forests, to the farmer, and, I was going to say, the cabinman also. The Dutch have stolen a march upon us in this respect, for Mr. Bartlett tells me that in a recent visit to Holland he saw them in a state of domestication, and that they do well.

It is, I believe, an absolute requisite for the reindeer that it be not kept on a clay soil; the soil upon which they thrive and breed in Holland is sandy.

Who has not heard of the Moose deer, or elk of Canada, and mentally followed the hunter in his active foot-race after the animal, or enjoyed the scene, where in a cold frosty night, with the air so still that a crack of a twig can be heard for half a mile, the sportsman lies secreted, from time to time calling the moose through his trumpet of birch bark. I show on the walls the result of this exciting sport, a magnificent head kindly lent me by Mr. Leadbeater, and am inclined to put the question—Why should there not be moose in those parts of England which are suited to them? and why should the English sportsman have to traverse the vast Atlantic to obtain a shot at one of these noble animals?

It often happens that one entire race of men is, for the most part, dependent upon a race of animals, and we have a good example of this in the North American Indian, who derives much of his sustenance from the great bison of the prairies. Every one has read and heard of the vast herds of these animals that are annually

pursued and hunted down, yet seem hardly to diminish in numbers. English sportsmen make special expeditions in search of these, and within the last few months the Hon. Grantley Berkeley has returned from an expedition which he undertook solely to kill these animals. He has brought home with him the magnificent trophy which, through the kindness of the Editor of the *Field*, I am now enabled to show you. What a magnificent animal for our English parks; it is not only ornamental, but also exhibits qualities which would in some persons' eyes give it greater charms. It is good to eat, and carries a hump on its shoulders, a taste of which would be quite sufficient to impress on the minds of our *gourmants* the necessity of becoming a convert to the acclimatisation of animals.

I need not refer to printed records as to whether the bison will live in this country or not. It is a fact accomplished. The Great Northern Railway will, with the permission of that noble-minded encourager of acclimatisation, the Earl of Breadalbane, carry us not many miles from a magnificent park where we may see the shaggy monster of the prairies cropping Scottish grass, and watched by Scottish keepers, and thriving well (like most foreigners) upon the fat of our favoured land. Our worthy friend, *Punch*, has unknowingly given us a helping hand in our desire to acclimatise this beast, for he has given us a capital caricature, which not only makes us laugh, but confirms, throughout the length and breadth of the land, the fact, should it ever be doubted hereafter, that bisons lived in Scotland, A.D. 1860.

I must not forget to mention in this place those noble beasts the Auerochs, of Russia. A pair of these, as we well know, were, through the interest of Sir Roderick Murchison, sent by the Emperor of Russia, to the Zoological Gardens, where they might be alive now if a murrain, which was at that time prevalent among cattle, had not unfortunately carried them off. We trust that we may yet see another pair in this country.

There is yet another beast that should be mentioned, the Yak, of Asia, of which we hear from the French Society, that a cross between it and the cow produces a hybrid, "a beautiful animal, which unites the good qualities of both parents."

From the deer tribe I now pass on to the other mammalia. And first let us, according to the rule I have laid down, see whether we cannot restore any of the British beasts whose bones we find fossil. In many parts of England, in Norfolk, Suffolk, Berkshire, Cambridge-shire, and in Scotland, we find fossil bones of the beaver; nay, more, Professor Owen writes, tradition refers the names and arms of the town of Beverley in Yorkshire to the fact of beavers having

abounded in the neighbouring river Hull; and Pennant says that two or three waters in Wales still bear the name of *Llynnyr-assange*, or the beaver lake. Now there are situations in abundance in the above-named counties where there is a great lake or stream, where beavers would, I am convinced, if properly protected and looked after, again establish their species. We all know how interesting this pretty harmless water engineer is in his habits; the ladies know how useful his fur is, and the hunters tell us he makes a capital dish when properly cooked. The specimens are exhibited by Mr. Roberts, furrier, Regent-street.

There is, I think, a vacancy in our English parks and farms for another useful and ornamental animal, which might easily be procured from Australia. My hearers, I see, have anticipated me when I recommend the kangaroo to their notice. I will not dilate upon their merits, but ask my readers to examine the flock of them at the zoological gardens, and to hear what the able and energetic secretary of the Zoological Society, Mr. Selater, says about them. Bennett's kangaroo is the most abundant species in Australia, extremely hardy, and much the best calculated for acclimatisation in an English park. In favourable localities it breeds with regularity, and with very little attention would rapidly increase in any of the Midland or Southern counties, where the soil is dry and the character of the ground affords shelter from the north-east. Mr. Gould asserts the excellence of kangaroo venison as a meat for the table, and the introduction of these animals would therefore be something more than a mere zoological luxury. Mr. Gould has kindly lent me a specimen of this animal. The skin makes good leather. There are many places, he tells me, in England where it would thrive admirably.

But we must not forget to mention an animal which would be very useful in this country, if it would live, but I fear the climate of England is not suited for it. There is now in common use a substance which is called "*alpaca*," and much might be written and said upon this subject. I prefer, however, to quote the words of my friend, Dr. Lankester, who, in his admirable lectures on the uses of animals in relation to man,* thus writes:—

"But I now pass to a family of animals that has recently yielded a large increase to our cloth manufacture. I allude to the *Alpaca* tribe or family, allied to the camels and dromedaries. When Pizarro conquered Peru, he found these animals employed as beasts of burden, and their wool used for making clothing. The Peruvian Government has placed an embargo upon the exportation of these creatures, so that we have only now and then seen them as curiosities in the collec-

* Robert Hardwicke, 192 Piccadilly. Price 1s.

tions of our Zoological Gardens ; but in 1846, it appears, some of this wool found its way to Bradford.

“ For the successful manufacture of this wool, we are indebted to the energy and enterprise of Mr. Titus Salt, who, in the application of this material to the making of cloth, has succeeded in laying the foundation of one of the largest manufacturing establishments in this country, and has conferred a blessing upon his own country, as well as the countries in which the animal is reared.

“ The length of the hair of the alpaca renders it of considerable value for mixing with goat’s wool, silk, and other materials. There are four forms of these animals, very distinct from each other—the Llama, the Alpaca, the Vieugna, and the Guanaco. The Vieugna yields very fine hair, which is very much valued, but the Alpaca yields the most useful hair.

“ I have mentioned the advantage of acclimatising other animals. There would be no difficulty apparently in acclimatising these animals in Australia, though were they have been tried in this country, the rot has seized them, because of the tenderness of their feet. A few months ago, several Alpacas were secured, in spite of the jealousy of the Peruvian Government, somehow or another, and sent over to Australia, where they have arrived ; and I understand that a first crop of wool has been secured, and that the flock is flourishing. Such experiments as these should be more extensively and systematically carried on, both in our country and in our colonies.”

The alpacas were introduced into Australia by Mr. Charles Ledger. His brother has been kind enough to put into my hands some papers relative to this matter, and I trust that the particulars of this most important act of acclimatisation may be given to the public in the form of a book, for no one who has not read the history of these animals can have any idea of the immense difficulties, dangers from storm, pestilence, and famine—to say nothing of a very considerable loss of money—which this bold and enterprising man underwent to carry out a scheme which promises to be of the greatest importance to the most flourishing of our British colonies.

By the kindness of a friend in Paris, I am enabled to give, from an article by M. Dupuis, in *La Patrie* of Sunday last, 25th November, a *résumé* of the animals, &c., now in the gardens of the Society at Paris, and learn that they now have, for the purpose of acclimatisation, examples of the following, viz. :—The hemione ; a mule between this beast and an ass ; pigs, from China ; the peccary, from Brazil ; the taper, from South America ; a flock of llamas and alpacas, and of yaks, zebras, various kinds of antelopes and gazelles, goats, sheep, agouties, and kangaroos.

BIRDS.

We have not all of us got parks or large farms, but there are thousands of persons who, as our poultry shows tell us, not only have

accommodation for the rearing and preserving of birds, but also take great interest in their welfare. It is, therefore, part of my plan to point out what new and interesting birds, according to the experience of the Zoological Society, will breed, and are capable of acclimatisation in this country—many of them may almost be said to have been partially acclimatised—but still, I give as full a list as I have been able to get together, and in each instance I give the authority of the Zoological Gardens. I have not included the various foreign song-birds, which, however, might well be included in our category, as they afford occupation and amusement to many thousands of English men and women.

And first as regards the PHEASANTS, we must mention the CHEER (*Catreus wallichi*).—Being presented to her Majesty the Queen, it lived for several years in the Royal Gardens at Buckingham Palace, and there is, therefore, every prospect of the present birds doing well in the Society's establishment.

The MONAL (*Lophophorus impeyanus*).—The rich beauty of its plumage, its size, and the grotesqueness of its actions at particular periods, are equally remarkable; and when we add that it seems to be extremely apt to endure the conditions of confinement; that it breeds without difficulty under that disadvantage in this country; that it is perfectly capable of bearing the severest rigour of our winter, it certainly appears that the introduction of this mountain bird into the forests of Scotland is not only desirable, but ought ere long to be accomplished.*

The "Phasianus Versicolor," from Japan. The Torquatus, from China. It has been proved that both these birds will cross with our own pheasants, and produce hybrids of a greater size than either of the parents, and of a most beautiful plumage.

Continuing the pheasants. I am enabled, through the kindness of Mr. Leadbeater, to exhibit skins of the following beautiful birds:—

The PUCRASS (*Peucrasia Macrolophia*), the horned tragophon (a most desirable species for breeding), the KALEGE (*Euphrocomus alboceratus*), the SNOW PARTRIDGE (*Tetrao gallus Himalayensis*), all from the Himalayan range, and which would do well if we could procure them, and this is by no means impossible.

The PEACOCK PHEASANT (*Polyplidion chinquis*).—Two pairs were transmitted in 1857, from the aviaries of the Babu Rajendra Mullick, of Calcutta, and the species having bred more than once in the collection of the late Earl of Derby, it is extremely desirable that this loss should be replaced.

* Mr. Gould has kindly lent beautiful skins of these two birds for exhibition, as well as of their hybrids with the common pheasant.

Then, we endeavour to purvey for the farm-yards; and, first on the list stand the CURASSOWS, of which we learn that they number some dozen species, most of which have been proved to be capable of enduring the climate of England, with moderate protection; and some of them have reproduced, both at Knowsley and in the possession of the Zoological Society. The Dutch amateurs who flourished in the last century had so far acclimatised curassows in Holland, that they were not unfrequently brought to table, and, at the present time, several instances are known both of curassows and guans breeding freely in the neighbourhood of Paris.

Nor must we omit the OSCELLATED TURKEY (*Meleagris ocellata*). Should a sufficient number of specimens be obtained, although it is certainly more delicate than the turkeys of Mexico and of the States, there is no reason to fear want of success in acclimatising it.

THE CUBIN COLIN (*Ortyx cubensis*), THE WELCOME COLIN (*Ortyx noxenus*), the CALIFORNIAN COLIN (*Callipepla Californica*).—These are all extremely prolific, and exceedingly disposed to reproduce in confinement; so that there will apparently be but little difficulty in acclimatising all those species which are indigenous to temperate regions.

The Californian colin is one of the most beautiful of the family, and is so naturally tame, that it has been known to breed freely in a cage, in the centre of Paris. It is perfectly hardy, and, as it is now becoming pretty numerous in collections, the day is probably not far distant when complete success will be attained in the experiment, which has been already commenced by a noble member of the Society to establish it as a game bird in this country.*

THE CRESTED GUINEA FOWL (*Numida crestata*).—I mention it in the hope that some further information, and other specimens may be obtained, by the notice of residents in West Africa being called to the bird, which would certainly make a very interesting addition to our poultry yards.

A most important bird next calls for notice, viz., the BRUSH TURKEY or TALEGALLA, of which, by the kindness of Mr. Gould, I am enabled to show you a fine skin. I have not time to give any details of the interesting mound-making habits of this turkey, so aptly described by Mr. Gould, in his magnificent work on "The Birds of Australia." This bird has made its curious nest and reared its young in the Zoological Gardens.

* Mr. Bartlett speaks most highly of this bird; it is very lively game, and amusing, and breeds well. One hen of his last year laid thirty-nine eggs, and they were all hatched under bantam fowls except two or three.

Again, we have, as before-mentioned, the GELINOTTE or HAZEL HEN, of the Germans. This would breed and do well in many parts of England, particularly in Kent.

THE RED-BACKED PARAKEET AND CRESTED GRASS PARAKEET.—There is scarcely a doubt that all the species which inhabit the cooler parts of Australia would reproduce as certainly as those which are here mentioned, wherever space and congenial treatment can be afforded to them.

THE WONGA PIGEON (*Leucosarica picata*).—Australia is rich in pigeons, not less than twenty-one species being figured in Mr. Gould's work. Of these the most desirable to acclimatise in Europe is the wongawonga, and the most graceful is the crested dove. The latter breeds very freely in confinement, when suitably accommodated. It is not only of considerable size, but, according to Mr. Gould's observation, a first-rate bird for the table, possessing a whiteness and delicacy of texture in its pectoral muscles, which are unapproached by any other species of this widely-spread and useful family.

THE CROWNED PIGEON (*Goura Coronata*).—These noble birds, although natives of New Guinea and its adjacent islands, not only bear the vicissitudes of our climate with the protection the aviary affords, but have almost every year re-produced in it.

And among water birds we find the following:—

THE PIED GOOSE (*Anseranas melanoleuca*).—A pair of these birds bred in the Gardens (in the pond 29) for the first time in 1859, and successfully reared four strong young birds.

THE WHITE-FACED SHIELDRAKE (*Casarca cana*).—Asshe is perfectly hardy, having survived all the subsequent winters without protection, and has laid almost every season, it is very much to be regretted that we have hitherto been unable to obtain additional specimens.

THE RED-BILLED DUCK (*Paccilonetta erythrorhyncha*) breed pretty freely in confinement, and are very desirable additions, as they are perfectly hardy, and require no more attention than the ordinary waterfowl of Europe.

THE DUSKY DUCK (*Anas obscura*).—It breeds without difficulty in a suitable locality, and might easily be established in any district where it could be preserved for the first few seasons.

THE SOMMER DUCK (*Aix sponsa*).—This beautiful duck is now well known in Europe, many hundred pairs having been imported from the United States, and almost as many bred on the ornamental waters of this country. Like its congener, the mandarin duck, it is arboreal in its habits, and not only builds its nest, but lives for a considerable part of its time in trees when in a state of nature.

THE ASHY-HEADED GOOSE.—(*B. poliocephala*).—Both of these

species are of great beauty, and are derived from the extreme southern limit of the American continent. They are perfectly hardy, and as the ashy-headed goose has increased rapidly since its introduction at Knowsley, in 1849, there is little room to doubt that the Upland goose will also, in a few years, become equally abundant in European collections. The genus to which these birds belong is closely allied to *Bernicla*, which includes the well known Brent goose, and *Bernicle*. They are rather terrestrial than aquatic in their habits, feeding almost entirely upon grass, which they graze with the closeness of a flock of sheep.

The SANDWICH ISLAND GOOSE.—(*Bernicla Sandvicensis*).—From these two pairs the whole of the birds now in European collections are descended.

The CEREOPSIS GOOSE.—(*Cereopsis Novæ-Hollandiæ*).—It breeds almost every year in the garden, laying its eggs in March, next after the Sandwich Island goose, which is the earliest species we have.

The BEAN GOOSE found now only wild in England, but might be easily domesticated.

The ROCK or MAGELLANIC GOOSE (*B. Magellanica*).

The SNOW GOOSE (*Antarctica*), both from the Falkland Islands, and which would breed well here.

The BLACK SWAN, of which Mr. Gurney writes to me—"The pair in my possession, at Carshalton, breed regularly twice a year, sometimes three times, and have in six years had about 131 eggs, hatched 83, and reared about 50."

The BLACK NECKED SWANS which have reared their young in the Zoological Gardens.*

The STANLEY CRANE.—(*Tetrapteryx paradisea*).—In the rich and varied collection of living animals which he subsequently accumulated at Knowsley, broods of this beautiful bird were hatched out on several occasions.

The WHITE STORK.—(*Ciconia alba*).—The white stork is one of the most familiarly known species of European birds although in England it has, from the changes effected by improved agriculture, become comparatively rare.

The MANTCHOURIAN CRANE.—(*Grus Montignesia*).—The birds which were taken to Paris by M. de Montigny, on his return from China, in 1854, have not only flourished there in the most perfect health, but have for three successive seasons made a nest and hatched out their young. The Mantchourian crane is a favourite bird among

* For the exhibition of the skins of many of these birds I am again indebted to Mr. Leadbeater.

the Chinese, and I believe that a considerable number of them are always in captivity at Peking.

The AUSTRALIAN CRANE.—(*Grus Australasiana*).—It evinces great aptitude for domestication, and is called there "the native companion," from the docility with which it accommodates itself to the society of man. Lord Powercourt does not confine his attention to mammalia alone. He also cultivates various kinds of birds, and the following is his list:—Pair of Polish swans; one black-necked ditto; one black ditto; one ruddy sheldrake; two ditto Mandarin ducks; one pair Carolina ducks; one ditto Bahama ducks (and a good many of other kinds;) one pair spur-wing geese; one ditto Egyptian geese; two ditto grey-leg geese (and several other kinds.)

There is a useful bird which may suit the tastes of some persons who have accommodation, and, I may add, wish for it; it is not very ornamental, but it is useful; I mean the LAUGHING KINGFISHER (*Dacelo gigantea*) which may be taken as the type of a considerable group of kingfishers, which differ essentially in their habits from the lovely bird which flashes like a jewel along the brooks and rivulets of Europe. These powerful kingfishers of Australia seldom approach the water, but live in the dry scrub, and feed like birds of prey upon insects, reptiles, and small mammalia, instead of fish. The laughing kingfisher is excessively adroit in catching mice, and will wait as patiently as a cat at a hole whence he expects one to emerge. His note strangely resembles a rude powerful laugh, and the united efforts of the fine specimens confined in the aviary are heard far and near every morning. The regularity with which this laughter rings through the Australian forest at certain hours of the day, has not been unnoticed by the colonists, and among other trivial names for the bird, they have given it that of the "Settlers' Clock."

As among the mammalia, I have endeavoured to point out a quadruped which might again be restored to this country, so among birds I beg to suggest that there is no reason why an attempt should not be made to restore to those places where they once existed, that magnificent bird the bustard. He lived here once, and that in the memory of many persons now alive. Why should we not restore him (and I know where to obtain specimens), and place them in the preserves of Norfolk and on the plains of Salisbury? the old sport of coursing the bustard might again be revived, and the table might be supplied with a fresh delicacy.

We now come to another most important branch of acclimatisation.

CULTIVATION OF THE WATERS.

No English dinner is complete without a dish of fish; and fish

diet is in itself most digestible and nourishing, particularly for invalids. There are indeed many races of men whose sole sustenance is fish. Again, consider the thousands of persons whose sustenance depends upon the capture of fish. It is marvellous to behold the fleets of fishing-boats that annually follow the herrings in their migration along our coasts, and financial returns of this fishery. With reference to fish-culture in the sea, we can do but little, except as regards one important fact, which was not long ago mooted in the *Times*, viz., the necessity of looking sharply after the size of the meshes of the nets, to prevent the destruction of the young fry, but if we cannot do much for fish, surely there are such things as what are commonly called shell fish; need I name the oyster and the muscle. As regards the oyster and the muscle, I have reference to several published facts to show that the cultivation of those articles of human food not only answers but even pays.

We then come to the cultivation of fresh-water fish, and this may be regarded in two points of view:—First, as regards the actual use of fish for food; secondly, as regards sport, and regulations for the anglers. Many persons laugh at the angler, and define him, according to Dr. Johnson's idea, as "a fool at one end, and a rod at the other;" but, mark you, we do not live in Dr. Johnson's time. Man's instinct for preying and destroying creatures, *feræ nature*, when unable to develop itself in fox-hunting or partridge shooting, manifests itself in the love of angling.

This noble art has now reduced its maxims to a science. Hundreds of brains and hands are at work on this subject, whether it be fly-fishing or bottom-fishing; and in London alone there are fishing-tackle makers innumerable, whose business would cease to exist if they were not well-supported; and within the last few months a most important movement has taken place as regards the Thames, for by the exertions of the Thames Angling Preservation Society and their secretary, Mr. Farnell, the practice of netting has been abolished, and the fish are now protected from Kew-bridge to the City stone beyond Staines-bridge, and even higher up the river. I hear that netting is gradually becoming abolished. Besides this, by the kindness of the Duke of Rutland, the Right Hon. Sidney Herbert, and others, several trout and grayling have been introduced at various points of the river.

It is a happy provision of nature that there is a fish to be found adapted to almost any sort of water, from the lordly salmon of the mountain torrent to the humble eel of the stagnant ditch. Why should not we pay a little more attention to the habits of fish, and transfer fish suited for a certain kind of water into that water, supposing there to be none there already? Let us *study* the transport

of fish, and utilise waters, whether great or small, which are now idle. The Dutchman does this; and he plants, so to speak, his canals with fish, and when the fruit is ripe he turns it into money. Were it otherwise, why should we find so many Dutch jack, perch, tench, and eels in Billingsgate Market, all commanding considerable prices?

Whether, therefore, we look upon fish as an article of food, or as affording healthful sport at a cheap rate, it is necessary that we should look to the cultivation of the waters. I had here intended to quote a letter from Mr. Edward Wilson upon "utilising waters," but I have not space for it. I do not wish to mutilate his admirable arguments. The best mode by which we can multiply fish is by the artificial reproduction of them, a mode long practised by the Chinese, and of late in several parts of England. Many may be inclined to laugh at the idea of hatching fish, but I beg to put forward an answer to them, which of all answers is the best—viz., that if properly carried out "fish-hatching will pay." Mr. Wilson tells us that "the annual value of salmon alone to Scotland is no less than £800,000 per annum, and to Ireland £300,000. With proper care of the young fish there is no reason why this large sum should not in time be doubled." I have lately visited the salmon-hatching ponds at Stormonfield, near Perth, and was surprised at the facility with which this process is carried out. This process is also going on at Lake Bearpot, and other places in Canada. I have also an account of "The French Piscicultural establishment at Huningue, near Basle," by Mr. Thomas Ashworth, which is supplied by the water of the Rhine, and no less than five kinds of fish are principally cultivated—viz., salmon, trout, ombre, chevalier, and Danube salmon. From this establishment the fish are sent all over France, and will in time produce great national results.

We have all of us heard of the attempts made to introduce salmon into Australia; within the last few months a sum of no less than £600 has been spent upon the object; it has unfortunately failed, but Mr. Lloyd, the aquarium dealer, of Portland-road, who has studied the subject of the transport of fish scientifically, says he is convinced that young salmon, if properly and scientifically watched during their long voyage, would arrive in safety.

There are many persons living who can recollect salmon being caught in the river Thames, and not many days ago a spawning fish was caught at Erith. We hail the appearance of this fish with glee. If one comes, why not more? Why should we not assist nature, and hatch salmon artificially on the chance of restoring them to the Thames, though I myself, in common with several other persons, am

sanguine enough to believe that we have more than a chance of restoring this noble fish to our beautiful river. Efforts are at this moment at work to obtain from the salmon spawning beds at Perth ova for the purpose of stocking other rivers, but I regret much to say that the Tay Commissioners have refused applications for the salmon ova, a fatal mistake. By giving them they would in reality lose no more than a person who gives a light to another from his burning candle; and by not allowing them to be taken they derive no advantage to their fishery, for a gentleman from Perth writes to me "at present we have salmon spawning in one ford from which as many ova are destroyed by trouts as would supply all that is wanted, and would no more impoverish the river than giving a handful of grain out of a granary full of corn." I trust the Tay Commissioners will withdraw their refusals of ova, and assist, not endeavour to arrest, the progress of pisciculture.

Of the science required for the raising fishes for the stock of home waters, thus speaks Sir Humphrey Davy, in his delightful work *Salmonica*:—"The result is easily attained, and the difficulties are quite imaginary. The impregnation of the ova of fishes is performed out of the body, and it is only necessary to pour the seminal fluid from the milt upon the ova in water. Mr. Jacobi, a German gentleman, who made many years ago experiments on the increase of trout and salmon, informs us that the ova and milt of mature fish, recently dead, will produce living offspring. His plan for raising trout from the egg was a very simple one. He had a box made, with a small wire grating at one end in the cover, for admitting water from a fresh source or spring, and at the other end of the side of the box there were a number of holes, to allow the exit of the water; the bottom of the box was filled with pebbles and gravel of different sizes, which was kept covered with water that was always in motion. In November or the beginning of December, when the trout were in full maturity for spawning, and collected in the rivers for this purpose upon the beds of gravel, he caught the males and females in a net, and by pressure of his hands received the ova in a basin of a water, and suffered the milt or seminal fluid to pass into the basin, and after they had remained a few minutes together, he introduced them upon the gravel in the box, which was placed under a source of fresh, cool, and pure water. In a few weeks the eggs burst, and the box was filled with an immense number of young trout, which had a small bag attached to the lower part of their body, containing a part of the yolk of the egg, which was still their nourishment. In this state they were easily carried from place to place, in confined portions of

fresh water, for some days requiring apparently no food ; but after a week the nourishment in their bag being exhausted, they began to seek their food in water and rapidly increased in size. As I have said before, Mr. Jacobi assures us that the experiment succeeded as well with mature fish that had been killed for the purpose of procuring the roe and the milt, these having been mixed together in cold water immediately after they were taken out of the body. I have had this experiment tried twice," continues Sir Humphrey, speaking in his own person, "and with perfect success, and it offers a very good mode of increasing to any extent the quantity of trout in rivers or lakes, for the young ones are preserved from the attacks of fishes and other voracious animals or insects, at the time when they are most easily destroyed and perfectly helpless. The same plan, I have no doubt, would answer equally well with grayling and other varieties of the salmo genus. But in all experiments of this kind, the great principle is to have a constant current of fresh and aerated water running over the eggs."

What has been said of Canada by Mr. F. Forrester, in his "Fish and Fishing" (Bentley, 1849,) will equally apply to many parts of this country.

There are thousands and tens of thousands of little tumbling transparent rills throughout this country—scarcely a farm without a dozen such—which have numerous natural basins in their courses, each of which, with the aid of a few hours' work employed in raising a timber dam, and applying a grate at the entrance and egress of the stream, would constitute as perfect a storepond for the making of such experiments as could be erected by the wealth of Cræsus ; with the advantage, too, of having the fish requisite for the tests existing, in a state of nature, within a few miles, perhaps within a few hundred yards, of the scene of action.* As an example of what has been done by the simplest possible apparatus, I would instance the introduction of the grayling into the Clyde by the Angling Club of Glasgow. In the *Field* of last Saturday, Nov. 24, is a description and also a plan of the process. Within the last few weeks, I have pointed out the advantages of pisciculture to a friend who has facilities, and who is at this

* As it is impossible to go very much into the subject, I have given a list of books relating to the art of Pisciculture :—"Book of the Salmon," in two parts, by Ephemera (Longman and Brown, 1850 ; "La Pisciculture et la Production des Saugues, par Jourdiér" (Hachette et Co., Paris, 1856) ; "A Treatise on the Propagation of Salmon and other Fish," Ashworth, (Simpkin and Marshall, 1853) ; "On Pisciculture," W. H. Fry, New York (to be obtained of the publisher, at 36 Soho-square) ; and the two works of Boccius (Van Voorst, Paternoster-row).

moment engaged in laudable endeavours to hatch trout near Canterbury.

But we must not flatter ourselves that we are altogether about to introduce pisciculture as a novelty into this country.

In former days, when the inhabitants of this country were for the most part Roman Catholics, and, therefore, greater eaters of fish, the cultivation of fish was looked after; and I would quote a good authority on this point:—

“That carp were introduced from the Continent to England by the monks is nearly certain; this, however, could be accomplished without recourse to any artificial modes of procuring or raising the young fry. There are, however, many and powerful reasons for believing that the grayling, the charr, the gwyniad, and perhaps also the vendace, the pollan, and the powan, were also introduced by the same agency from foreign countries. This belief is supported by the fact that these fish exist only in isolated and often distant waters, sometimes in only one or two neighbouring rivers, whereof that which contains them is apparently the least adapted to their habits, but always in such waters as had many or distinguished monastic institutions on their banks. While England was Catholic, great attention was paid to the raising and fattening of the choicest varieties of fresh-water fish, an art which sunk into neglect, partly owing, doubtless, to the abolition of fast-days, and partly to the great facility with which the finest sea-fish are now transported throughout the country.

“Even to this day, in Austria, Illyria, and parts of the Tyrol, the greatest attention is paid to the nurture of the most delicate fresh-water fishes in confined situations; and Sir Humphrey Davy states, in his *Salmonica*, that ‘at Admondt, in Styria, attached to the magnificent monastery of that name, are abundant ponds and reservoirs for every species of fresh-water fish, and the charr, grayling, and trout are preserved in different waters, covered, enclosed, and under lock and key.’”

There is no reason why we should be behind our ancestors in this matter, therefore let us set to work and see what is to be done.*

As regards insects and plants I have somewhat to say, but my limits will not allow me more space than to state that there exist many specimens of both; to instance in the one class the Ligurian

* I have received information from Mr. Lloyd, of Portland-road, that in the hot summer of 1859, he sent out to the Cape of Good Hope a quantity of carp and tench, that he delivered 75 per cent. of them alive, and that they since multiplied amazingly. He is about to send out some trout to the Cape.

bee, which Mr. Tegetmeier, secretary of the Apian Society, has already partially succeeded in acclimatising. By the kindness of this gentleman I am enabled to show specimens of the bee. He gives it a most excellent character; it would be a great adjunct to our farm economy. As regards plants I have much to say, but I dare not break into this subject, which would require an evening to itself; suffice it to say, that there is an immense opening for the introduction of plants that would prove to be of the greatest use both to the poor and the rich.

I have now taken a hasty and summary survey of the animal kingdom, and have presented to your notice what facts I have been able to obtain relative to various beasts, birds, fishes, &c., which are capable of acclimatisation. We have space and means, and food for many of them in our own favoured island; we know where they are, we can get them with interest, labour, and money, and when they arrive here we have, I am convinced, and actually know, many who will take charge of them. We, as Englishmen, are particularly lucky as to our chances of obtaining them. It is said the sun never sets upon the possessions of our most gracious Queen. English vessels are sailing daily to and from our colonies. Let us establish a system of interchange, receiving in return that which will be advantageous to us at home; for up to this time this country has been acting on the principle of "all give and no take;" we export thousands of our best living productions—how few do we import. We have all the crude materials provided by Nature herself; for an extensive scheme of acclimatisation at hand, all we want is the interference of man, who shall apply energy and capital.

How then is this great object to be carried out. Individuals are comparatively powerless, but by means of a union of efforts, in the shape of a society, something might be done; at all events it is well worth a trial. The idea, therefore, having been started, took a tangible shape but a few months ago. The intelligent proprietor of the *Field* newspaper (a journal which opens its columns to the encouragement of that talent of observation and love of natural objects which we all of us instinctively possess), Mr. John Crookford, the Hon. Grantley Berkeley, and myself held a consultation as to whether it was not possible to direct into one channel the many facts relating to the subject of acclimatisation which were floating about, little heeded.

The Hon. Grantley Berkeley, as is well-known, is a gentleman who has devoted much of his life to the active pursuit of field sports, and during a long course of years he has devoted his

attention, not solely to the *destruction* of animal life, but also to the accurate observation of facts relating to the creatures' natural habits and instincts—I may say social economy. This gentleman has kindly used his influence in obtaining the support of many noblemen and gentlemen, who have means and space for the work of acclimatisation, and I am now able to present a long list of noble patrons, which, indeed, gives us great hope of ultimate success.

Added to this, Mr. Crookford most liberally gave us all the assistance he could afford by means of the press ; and as for myself I have used, and hope always shall use my best energies, not only in starting, but in keeping going the first public attempts at Acclimatisation in England.

It was therefore determined to start at once a Society for the Acclimatisation of Animals, and we held the first meeting on June 10th, 1860. We have on our Council men who are willing to devote their energies to the object. We have for Vice-President the Hon. Grantley Berkeley, and as Secretary your most obedient servant. Our plans are based upon those of the Société d'Acclimatation, and I have ventured to put forth the following programme, to show what are our plans of operation :—

The purposes of the society are—

1. The introduction, acclimatisation, and domestication of all innocuous animals, birds, fishes, insects and vegetables, whether useful or ornamental.
2. The perfection, propagation, and *hybridisation* of races newly introduced or already domesticated.
3. The spread of indigenous animals, &c., from parts of the United Kingdom where they are already known, to other localities where they are not known.
4. The procurement, whether by purchase, gift, or exchange of animals, &c., from British and foreign countries.
5. The transmission of animals, &c., from England to her Colonies and foreign parts, in exchange for others sent thence to the society.
6. The holding of periodical meetings, and the publication of reports and transactions for the purpose of spreading knowledge of acclimatisation, and inquiry into the causes of success or failure.

The society will begin with small and carefully conducted experiments,

It is proposed that those members who happen to have facilities on their estates for experiments, and who are willing to aid the objects of the society, should undertake the charge of such subjects for experiments as may be offered to them by the society, periodically reporting progress to the council.

It will be the endeavour of the society to attempt to acclimatise and cultivate those animals, birds, &c., which will be useful and suitable to the park, the moorland, the plain, the woodland, the farm, the poultry-yard, as well as those which will increase the resources of our sea-shores, rivers, ponds, and gardens.

It is hoped that this endeavour to increase the internal resources of the country will meet with the support of the public.

Persons desirous of becoming members may do so on subscribing £2 2s. per annum. A donation of £10 will make the donor a life-member of the society.*

The Society thus formed have had several meetings, and discussed several points; they have obtained promises of support and co-operation from many persons who are interested in the subject. Among others who attended the meetings was Mr. Edward Wilson, whose name is so well known in connection with the operations and successful efforts he has so nobly made to acclimatise animals in Australia. This gentleman addressed a most powerful letter to the *Times*, (which I regret I have not space to print in full,) whereby he raised the public mind to the importance of acclimatisation, and did an essential service.

Shortly after this letter appeared in the *Times*, at a meeting held October 6th, 1860, Mr. Wilson announced publicly that Miss Burdett Coutts, with that generosity and kindness of heart which has gained for her the respect and esteem of all classes, both rich and poor, had presented the Society with the munificent donation of £500, together with a promise of subscription of £10 annually for five years. Thus did this excellent lady stretch out the hand of encouragement towards those who were endeavouring to do good in their generation, and we may now state that "The Society for the Acclimatisation of Animals" is fairly on foot, and the Council are willing to understate such steps as shall be most advisable, in opening the active operation in a field new and unexplored. We are as yet young, and amid the *embarras des richesses* we feel it difficult to know how to begin.

In his letter to the *Times*, Mr. Wilson stated that a great want in this country was a domestic animal not too large to be consumed by a middle-class family, and the flesh of which should be meaty rather than poultry like. Our sheep are too large for this purpose; pork is not wholesome if used too frequently or killed too young; and rabbits are too small, flavourless, and white-meat.

* Temporary Offices, 346 Strand.

For the new animal the wombat was suggested, a rodent which burrows in the earth, feeds by night, and has flesh which affords excellent eating. It abounds in districts of Australia.

Here, then, is an animal which might be tried, but I fear there would be some difficulty in getting it generally adopted as an article of food, for prejudice would be in the way.

It remained, therefore, for us to cast about and see what sheep we could find which would come up to the necessary requirements. I shortly afterwards received a letter from Dr. Gardner, mentioning a sheep which would answer the purpose, viz., the Purick sheep, which is found in the districts of the Himalaya. Long correspondence ensued about this sheep, as well as other small kinds of sheep, which were to be procured in different parts of the world. At length I heard of a small sheep which had been imported from Brittany by Mr. Baker, of the Pheasantry, Beaufort Street, Chelsea. Whether this be the Purick sheep or not Dr. Gardner or not I am not aware; anyhow, I show it alive this evening, that persons may judge for themselves of the advisability of endeavouring to make this sheep, or a sheep like it in size, &c. general in this country. It is certainly a very little beast to begin our acclimatising efforts with, but I look at it in the light of the proverbial "small end of the wedge." The habits of this animal are exceedingly hardy; it lives in a wild, barren place, and I should suggest its adoption by persons who have a lawn or grass plat, or still better by cottagers, who could turn it out to live on the grass which grows about our hedges and ditches, and which is often wasted by not being grazed down.*

The second point the Society intend to commence with—is the introduction of game birds. The Hon. Grantley Berkeley, in his wanderings on the prairies of America, was much struck with the advisability of endeavouring to acclimatise in this country the prairie grouse and the tree grouse of America (of which I now show specimens, and relative to which I have much information.) This gentleman became acquainted with several persons who are willing to aid him by sending over these birds, and also some specimens of American deer. Captain Hardy, of the Royal Artillery, has kindly promised to send us over from Halifax, where

* As regards sheep, I would also mention that we intend to pay attention to animals which are likely to effect improvements in wool, but as the subject has been so admirably treated by Professor Owen in his lecture on the raw materials from the animal kingdom, in the Great Exhibition, given in this theatre December 10th, 1851, and also by Mr. Leonard Wray, in the *Journal of the Society of Arts*, Vol. VIII., No. 377, Feb. 10th, 1860, it would be presumption in me to touch upon the subject.

he is now quartered, not only living grouse but also their eggs, relative to the transport of which for long distances I have again many valuable hints from practical men.

Thus we have endeavoured to select, as opportunity afforded us (for we are not yet rich enough to choose), a specimen of a beast and a bird. It only remains now to find a fish which shall take the place and become a useful pond fish, and we have, I believe, found a fish, the "Lucid Perea" or the "Sander" (of which I show a drawing the natural size). From all evidence we have received, this appears to be the fish we wanted. We want to get him over here, and I am in the track to do so by means of an apparatus kindly lent us by Mr. Wilson; and when he arrives here, I know a gentleman who has kindly offered to receive him and treat him with all the deference due to such a distinguished (and we trust also useful) foreigner.

One of our objects, as you see from the programme, is to collect information. All information is valuable, for it prevents action in false directions, and suggests plans.

We have been fortunate enough to receive correspondence from many parts of the world, and not only correspondence but actual co-operation, for, in September last, the Society sent, by invitation, a deputation to Glasgow. A meeting was held, the Lord Provost in the chair, the result being, that there has been formed by the enlightened citizens of this noble town, a Scottish branch of the London Acclimatisation Society; and thanks to them for their cordial reception and assistance.

I wish, in this place, to state publicly, once for all, that the Society just formed is by no means desirous to run counter, or be set up in opposition to, the Zoological Society of London. The Council, on the contrary, trust that they shall obtain their co-operation and support, inasmuch as the point aimed at by them will be to carry out measures in full which are not insisted upon by that highly scientific body of men.

Again, I feel convinced that, as time goes on, the Government of this country will be convinced of the national importance of Acclimatisation. But lately the subject of the systematic interchange of the natural productions of the British dependencies was brought under the notice of the Colonial Office by the Earl of Carnarvon, and his Grace the Duke of Newcastle replied that it had been in his power to render some service to the cause by writing to the governors of several of our colonies, but that anything like a vote of public money was inexpedient.* In his letter

* See Mr. Wilson's letter to the *Times*, for Sept. 22nd, 1860.

to the *Times*, Mr. Wilson asks:—"Is your Government right, while surrounded by fifty fine colonies of unknown capacities, to leave everything to private enterprise; and, if private enterprise fails, to allow the noblest undertakings to rest, comparatively untested by any effort whatever." Let us do our best, and rely that the Government will, sooner or later, recognise our exertions and help us in our endeavours for the public good.

I have now performed my task (inadequately, I fear), of putting before this Society some few facts relative to the Acclimatisation of animals, and I trust that I have succeeded in making it appear that this is a subject the details of which are not only highly interesting, but can be carried out with the prospect of great and most important results. Much, nevertheless, will depend upon individual exertion and support, and I here beg to appeal to all those who can (and there are many who have the opportunities) to help us as much as they can. Mr. Mitchell, with an encouraging tone, writes:—"If a hundred of our great proprietors would each give up the necessary space and money to cultivate one single species, no matter of how great or how little importance, the result in twenty years would infinitely surpass all that could ever have been done by so miscellaneous and comparatively unmanageable assemblage as that marvellous collection of Lord Derby's, of which we speak with affection and regret."

Again, a writer in the *Saturday Review*, April 14, 1860, most justly says:—"When we consider the enormous influence produced upon the history of mankind by the sheep, the horse, the dog, and others of our domesticated animals—formerly, without doubt, existing in a state of nature, and reclaimed from it by the agency of man—who can deny that results, if not equally great, yet of the utmost importance to the human race, may follow from additions yet to be made to the list? It would be strange indeed if, out of the numerous species not known to science to choose from, and with all the experience of modern civilisation, we were altogether to fail in selecting some with constitutions sufficiently pliable to be moulded into races subservient to the use and profit of mankind. It is true that the importance of the animals recently added to our domestic stock is not great, and their number insignificant. But this, perhaps, is as much attributable to the *little attention* that has been paid to the subject as to any supposed exhaustion of the series of 'acclimatisable' animals."

I do not wish it for a moment to be supposed that I am sanguine or enthusiastic enough to imagine that a quarter or even a third of the animals, &c., will ever be acclimatised or made useful in

this country, or, that the Society established for this purpose will be able to make a very large gap in the 140,000 animals mentioned in M. Geoffroy Saint Hilaire's list, but as I have to treat on a subject as a whole, I should be failing in my duty if, to a large and highly educated audience, I did not endeavour to lift up the veil which secures that great panorama with which we are everywhere surrounded, to point out with the rod of experience those living creatures which actual experiment had positively proved and demonstrated could live and multiply their species in our own favoured land, or to suggest several foreign creatures that might, and would most probably live, if conditions were made by the hand of man suitable to their welfare.

My object has been to show what a wide field is now open for public as well as individual exertions, and how much is left unheeded which ought to be cared for. I have cast my bread upon the waters, in hopes that time will lead to the most important national results, and that we may live, one and all of us, to carry out as far as in us lies, that great command which was given to our first parents, and from them to ourselves, by the great Creator himself, to have "dominion over the fish of the sea and over the fowl of the air, and over every living thing that moveth upon the earth."

THE ACCLIMATISATION SOCIETY OF VICTORIA.

At a public meeting on the 25th February, presided over by His Excellency Sir Henry Barkly, an Acclimatisation Society was established in accordance with the resolutions annexed, to which the Provisional Committee desire to invite attention.

"That the extent of area, variety of climate, and comparative recency of settlement of Australia, invest the subject of acclimatisation with particular interest; and that the establishment of an Acclimatisation Society, on the basis of those of Paris and London, being highly desirable, such society be now established."

"That the objects of the society shall be the introduction, acclimatisation, and domestication of all innocuous animals, birds, fishes, insects, and vegetables, whether useful or ornamental;—the perfection, propagation, and hybridisation of races newly introduced or already domesticated;—the spread of indigenous animals, &c., from parts of the colonies where they are already known, to other localities where they are not known;—the procurement, whether by purchase, gift, or exchange, of animals, &c., from Great Britain, the British colonies, and foreign countries;—the transmission of animals, &c., from the colony to England and foreign parts, in exchange for others sent thence to the society;—the holding of periodical meetings, and the publication of reports and transactions, for the purpose of spreading knowledge of acclimatisation, and inquiry into the causes of success or failure;—the interchange of reports, &c., with kindred associations in other parts of the world, with the view, by correspondence and mutual good offices, of giving the widest possible scope to the project of acclimatisation;—the conferring rewards, honorary or intrinsically valuable, upon seafaring men, passengers from distant countries, and others who may render valuable services to the cause of acclimatisation."

"That Mr. D. S. Campbell, Dr. Thos. Black, Capt. Pasley, Professor McCoy, Dr. Embling, Dr. Mueller, Messrs. Hugh Chambers, Archer, McMillan, Lyall, Pyke, Sumner, members of the Zoological Committee, and Mr. Edward Wilson, with power to add to their number, be requested to act as a provisional committee, to bring the association into working order, to enroll subscribers, and otherwise advance the objects of the society."

"That a subscription of £2 2s. annually shall constitute an ordinary member; a donation of £10 10s. shall entitle the donor to a life-membership; but that the claims of the society shall be urged upon wealthy and patriotic colonists, with a view to obtaining much larger subscriptions."

"That, when thoroughly organised, the objects of the society be formally brought under the notice of the Government, with the view of learning to what extent it may calculate upon Governmental assistance and recognition."

A large number of names was at once enrolled, and a considerable sum subscribed.

It will be quite apparent, however, that the progress and usefulness of the new Society must be regulated by the measure of support and co-operation accorded to it by the more intelligent and patriotic amongst the colonists, and the Committee therefore venture to invite assistance by donation and subscription, remitted to the Treasurer, *pro tem.*, T. J. Sumner, Esq., Flinders Lane.



